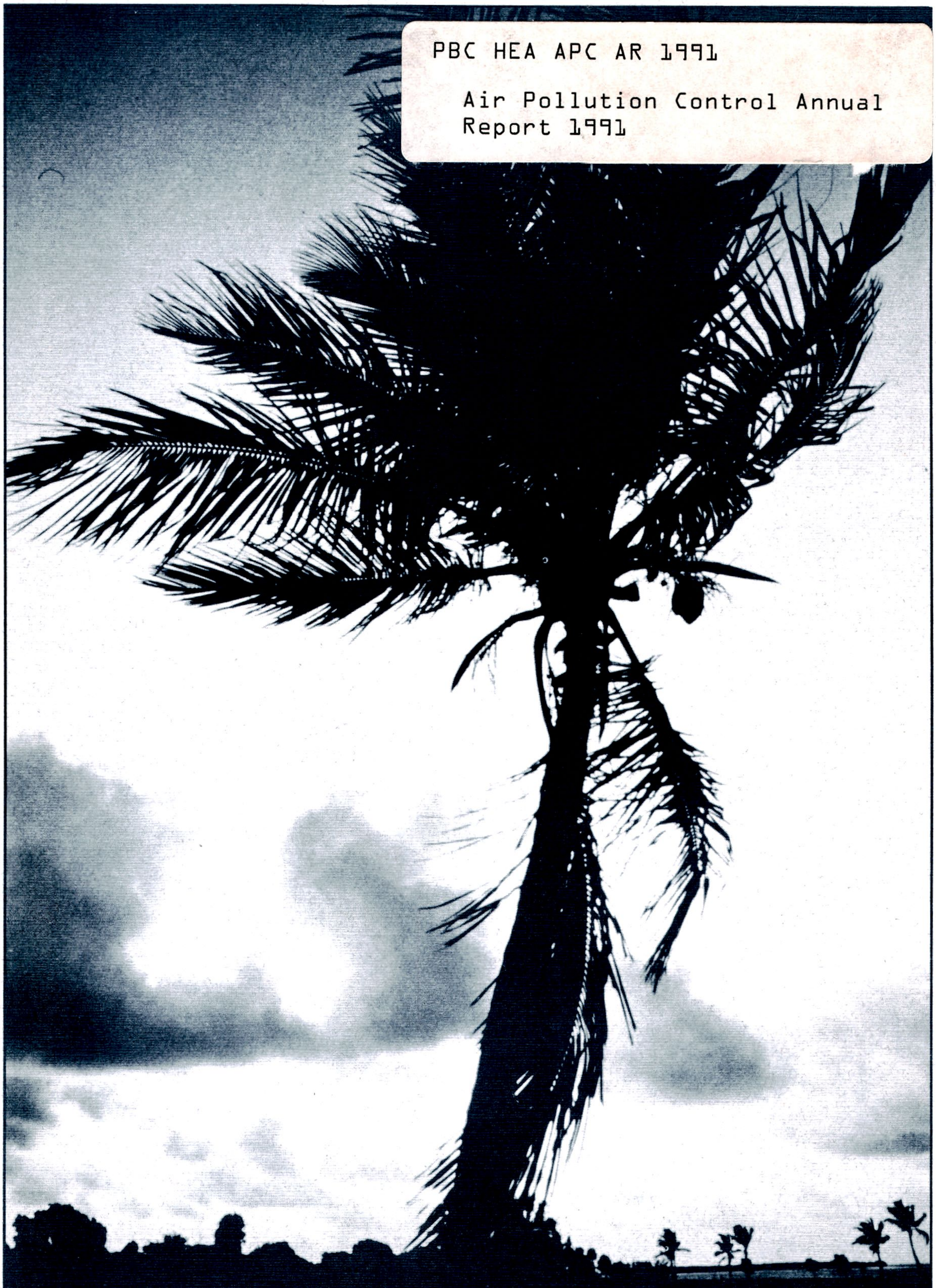
AIR POLLUTION CONTROL ANNUAL REPORT

1991

PBC HEA APC AR 1991

Air Pollution Control Annual Report 1991



Photograph by John J. Lopinot

HRS/Palm Beach County Public Health Unit/Environmental Science & Engineering

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Message from the Director

The environment that surrounds us, the air that we breathe, is of vital public health concern. Any strategy for reducing air pollution and improving air quality depends upon public awareness and interest. It is the intent of the HRS/Palm Beach County Public Health Unit to raise such awareness through this annual air program report.

The major air pollutants, carbon monoxide, lead, nitrogen oxides, ozone, particulate matter and sulfur dioxide, can have an adverse impact on our health. The identification and monitoring of the sources of air pollution as well as on going assessment of total air quality are the foundation for our air pollution control activities.

By informing the public of Palm Beach County of the area's ambient air quality and those programs that presently address air pollution prevention, the community can gain knowledge on this important issue and thereby support the new challenges that we face in protecting our air quality.

Jean M. Malecki

Jean M. Malecki, M.D., M.P.H.
Director
Palm Beach County Public Health Unit

Table of Contents

I. Introduction 1
Characteristics of Palm Beach County 2
Organization and Goals 2

II. Major Air Pollution & Health Effects 3
Carbon Monoxide 3
Lead 3
Nitrogen Oxides 4
Ozone 4
Particulate Matter 4
Sulfur Dioxide 5

III. Air Quality Assessment 5
Meteorology 5
Ambient Air Monitoring 6
Carbon Monoxide (CO) 7
Nitrogen Oxide (NO_2) 7
Ozone (O_3) 7
Particulate Matter (PM) 8
Sulfur Dioxide (SO_2) 8
Air Quality Index 8
Pollen and Mold Spore Count 9

IV. Sources of Air Pollution 9
Stationary Sources 11
Mobile Sources 11
Area Sources 11
Emissions Inventory 11

V. Air Pollution Control Activities 13
Permitting 13
Inspection and Compliance 13
Complaints 14
Enforcement 14
Mobile Source Program 14
Asbestos 14
Open Burning 15
Indoor Air Section 15

VI. Public Information 15

VII. New Developments 16
New Clean Air Act Requirements 16
Protecting Ozone in the Upper Atmosphere 17
Biohazardous Waste Incineration 17

Charts, Graphs & Tables

Palm Beach County Population Map 2

Ambient Air Quality Standards (Table II.1) 3

1991 Annual Meteorological Data (Table III.1) 6

Ambient Air Monitoring Stations(FigIII.2) 6

Maximum Carbon Monoxide Concentrations (Fig III.3) 7

Maximum Monthly Ozone Concentrations (Fig III.4) 7

Highest Annual Ozone Concentration(Fig III.5) 7

1st & 2nd Highest 24 Hour Average
Concentrations of PM10 (Fig III.6) 7

Concentration of PM10 per Station (Fig III-7) 8

Concentrations of SO_2 (Fig III.8) 8

Air Quality Index - A.M. Data (Fig III.9) 9

Air Quality Index - P.M. Data (Fig III.10) 9

Pollen & Mold Spore Counts (Fig III.11) 9

Total Pollutant Emissions (Fig IV.1 10

Volitile Organic Compounds (Fig IV.2) 10

Emissions Inventory Summary (Table IV.3) 12

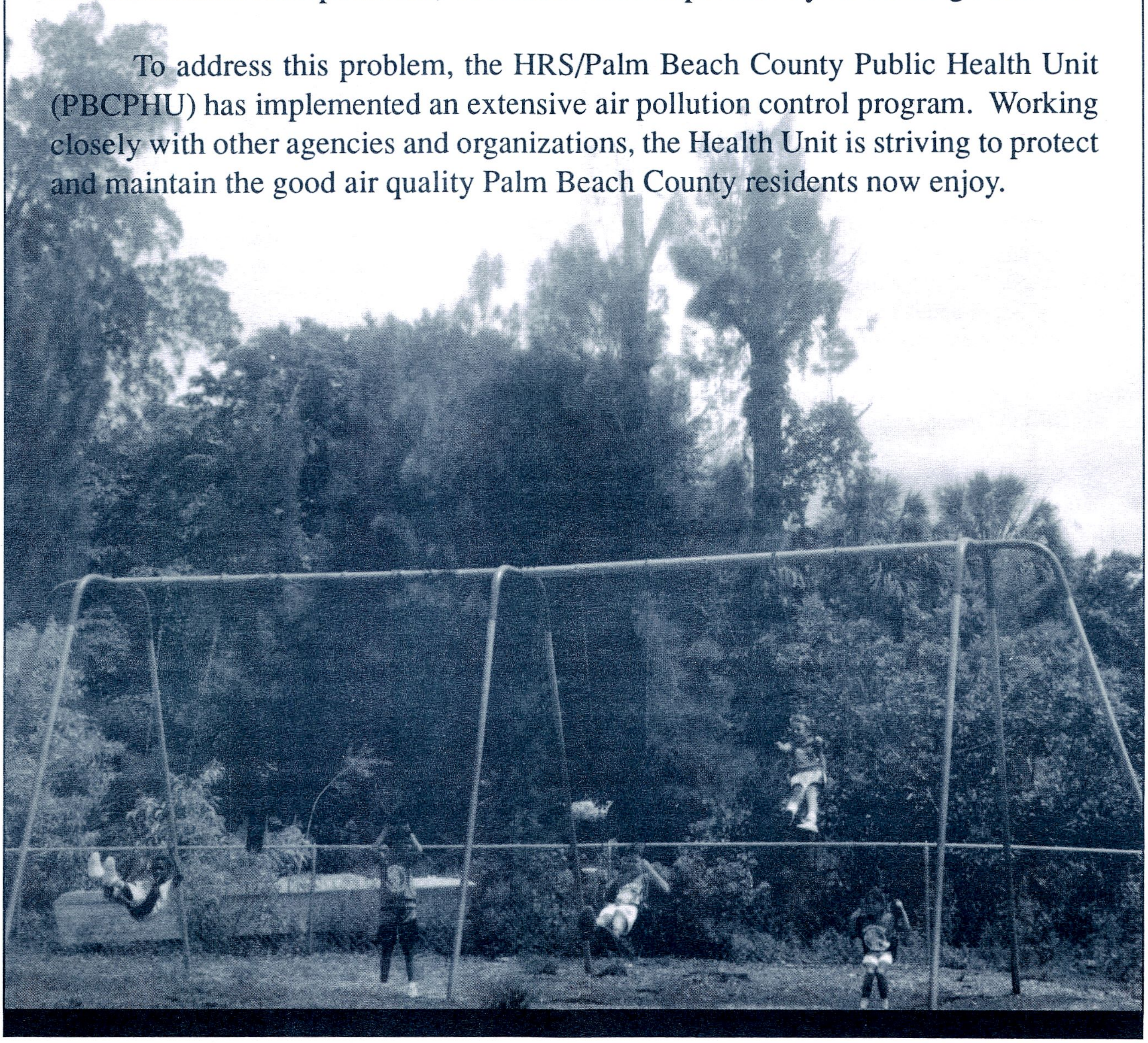
Activities Summary (Table V1) 13

ANNUAL REPORT
1991

▼I. INTRODUCTION

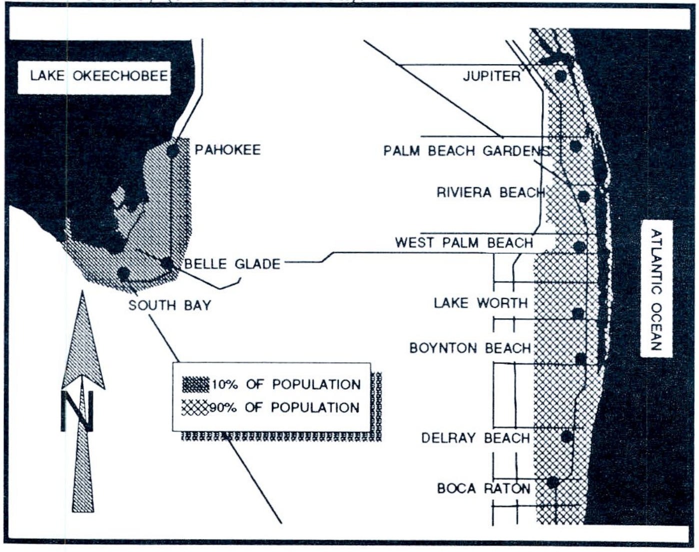
Air is an essential natural resource, one that we cannot afford to take for granted. Many everyday activities contribute to pollution of this vital resource. Clean air is important. A decline in overall air quality can damage health and property, and affect business, recreation and tourism. Since each of us contributes in some manner to air pollution, we must all take responsibility for seeking a solution.

To address this problem, the HRS/Palm Beach County Public Health Unit (PBCPHU) has implemented an extensive air pollution control program. Working closely with other agencies and organizations, the Health Unit is striving to protect and maintain the good air quality Palm Beach County residents now enjoy.



▼Characteristics of Palm Beach County

Palm Beach County is located along the southeast coast of Florida, and is part of what is generally called the "Florida Gold Coast". Containing about 2000 square miles, Palm Beach County is geographically separated into two regions. One region is a highly urbanized coastal strip, stretching approximately forty-five (45) miles north to south, from Tequesta to Boca Raton. The other region is agricultural, located in the western portion of Palm Beach County (the Glades Area).



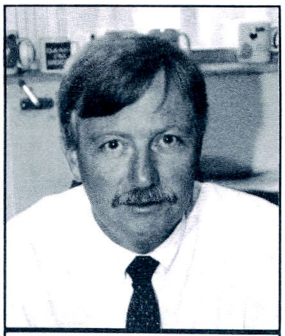
The estimated population of Palm Beach County in 1991 is 883,044. About 90% of the population is located along the coast, reaching inland about 15 miles. Rapid development in recent years has resulted in the growth of several municipalities within this coastal strip. The major cities with populations over or approaching 50,000 are West Palm Beach, Boca Raton, Delray Beach, and Boynton Beach.

The area around Lake Okeechobee contains almost all of the remaining 10% of the county's population. Municipalities in the Glades Area include Belle Glade, Pahokee, and South Bay. The economy of this area is agricultural, based on sugar cane and winter vegetables.

Tourism and related businesses continue to be the dominant economic factors in the urban area. Tourism has kept pace with an increasing population. Other major industries in the area include building construction and related fields, agriculture, aircraft testing, computer & electronics manufacturing, concrete, asphalt and service industries.

The complexity of the problems of air pollution control are related to the widespread growth in Palm Beach County. Advances in environmental protection activities, which are being carried out by this program, have been utilized in order to keep abreast of air pollution problems. These activities are characteristic of urban areas across the nation.

▼Organization and Goals

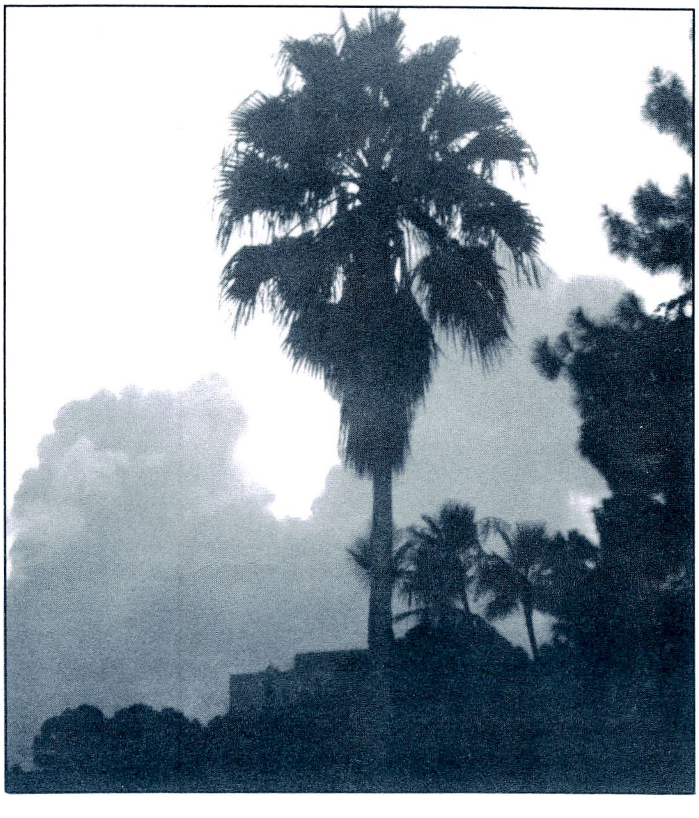

Jim Stormer
Air Program Adminsitrator

The air pollution control program is organized under the HRS/ Palm Beach County Public Health Unit's Division of Environmental Science and Engineering. Established in 1965, it is one of the oldest and most experienced programs in the state. Operating on behalf of Palm Beach County, the Health Unit's program is recognized by the Florida Department of Environmental Regulation as an approved local air program.The program is supported by general revenue funds, a federal grant, and motor vehicle registration fees.

The goals and objectives of the Health Unit's air program include:

- Attain and maintain National Ambient Air Quality Standards.
- Protect public health, safety and welfare.
- Promote air quality preservation and the conservation of our natural resources.

To accomplish these goals, the air pollution control program is organized in two general areas: air pollution control and air quality assessment. Given sufficient resources, adequate regulations and, most importantly, the support of the public, these goals and objectives can be achieved.



II. MAJOR AIR POLLUTANTS & HEALTH EFFECTS

A number of air pollutants can cause damage to our health. The Clean Air Act provides for the establishment of National Ambient Air Quality Standards (NAAQS) for a select list of air pollutants. These "criteria" air pollutants are the most prevalent and have the greatest overall adverse impacts on health. The standards are designed to protect public health with a margin of safety, and are based on the best available scientific evidence. Table II. 1 lists the current NAAQS for the six criteria air pollutants and a description of each pollutant follows.

AMBIENT AIR QUALITY STANDARDS

POLLUTANT	UNITS	FEDERAL Primary	FEDERAL Secondary	STATE
Inhalable Particulate Matter				
Annual Arithmetic Mean	µg/m3	50	—	Same
Maximum 24 Hour Value	µg/m3	150	—	Same
Sulfur Oxides				
Annual Arithmetic Mean	µg/m3	80	—	60
	PPM	0.03	—	0.02
Maximum 24 Hour Value	µg/m3	365	—	260
	PPM	0.14	—	0.10
Maximum 3 Hour Value	µg/m3	—	1300	Same
	PPM	—	0.50	Same
Carbon Monoxide				
Maximum 8 Hour Value	mg/m3	10	Same	Same
	PPM	9	Same	Same
Maximum 1 Hour Value	mg/m3	40	—	Same
	PPM	35	—	Same
Ozone				
Maximum 1 Hour Value	mg/m3	235	Same	Same
	PPM	0.12	Same	Same
Nitrogen Oxides				
Annual Arithmetic Mean	µg/m3	100	Same	Same
	PPM	0.05	Same	Same
Lead				
3 Month Average	µg/m3	1.5	Same	Same

TABLE II.1 Federal and State Ambient Air Quality Standards

▼*Carbon Monoxide*

Carbon monoxide (CO) is a colorless, odorless and tasteless gas. It is formed during incomplete combustion when carbon containing fuel is partially oxidized to carbon monoxide rather than carbon dioxide ($CO2$). The major source of carbon monoxide (90%) is from motor vehicle emissions, mostly from poorly tuned automobiles.

Carbon monoxide is toxic because it combines with hemoglobin in the blood that transports oxygen to cell tissues. Carbon monoxide has 210 times the affinity for hemoglobin than oxygen, and it remains more tightly bound. Because it competes with oxygen, it can seriously interfere with the transport of oxygen throughout the body. The amount of carbon monoxide that combines with hemoglobin is dependent upon the concentration of carbon monoxide in the air and the length of exposure. Concentrations in excess of 750 parts per million can cause death by asphyxiation.

Exposure to ambient levels exceeding the standards can effect the central nervous system as a result of reduced oxygen levels in the brain. Effects include impairment in the ability to estimate time intervals, discriminate brightness and react to visual stimuli.

Individuals suffering from anemia or a cardiovascular disease, such as emphysema, are more likely to be affected by carbon monoxide. Cigarette smokers, and those exposed to environmental (second hand) tobacco smoke, are also more susceptible to the effects of carbon monoxide. This is a result of the environmental exposure adding to the already elevated residual CO levels in the blood due to cigarette smoking.

▼*Lead*

Until recently, the major source of lead in the atmospere was from automobiles using gasoline containing lead. However, the use of lead compounds as gasoline additives is being phased out, with a nationwide ban to take effective in 1994. Another contributing source of lead emissions in Palm Beach County is a municipal waste combustor.

Automobiles are a major source of Carbon Monoxide

Airborne lead can enter the body through inhalation, ingestion of food goods, or drinking water contaminated with lead particle deposits. Upon entering the body, lead can be absorbed in the blood stream and distributed throughout the body where its toxic effects can cause damage. The most sensitive organs and systems are the blood, the brain and nervous system, the kidneys, and the repoductive system.

Young children are at particularly at risk because the adverse health effects occur at lower lead levels than for adults. Moreover, children are more likely to be exposed through the ingestions of soils and dust containing lead as a result of playing in heavily urbanized or industiralized settings. Studies have documented that learning disabilities and lower IQs can occur in children having elevated lead levels in the blood.

▼*Nitrogen Oxides*

The atmosphere is made up of about 78% nitrogen and 21% oxygen. During combustion under high temperatures and pressures, (i.e., automobile engines and electric utility plants) these two elements combine to form nitrogen oxides. From an air pollution standpoint, the two compounds of major concern are nitric oxide and nitrogen dioxide.

Nitric oxide (NO) is a colorless and odorless gas. It is relatively non-irritating, and at ambient level does not pose a health threat. However, NO can be oxidized in the atmosphere through photochemical reactions to form nitrogen dioxide which is a health concern.

Nitrogen dioxide (NO_2) is a reddish-brown gas that is considered toxic. At elevated levels above ambient conditions, it can cause damage to the respiratory system and aggravate respiratory infections.

Nitrogen oxides can also contribute to acid rain. However, the primary concern with nitrogen oxides is that they contribute to ozone formation. This leads to further increases in the creation of smog.

▼*Ozone*

Ozone is a highly reactive compound made up of three oxygen atoms (O_3). It is characterized by a pungent odor and faint bluish tint. It is a strong oxidant, and is one of the more toxic regulated air pollutants. Ozone also causes damage to vegetation, crops, and materials (especially those containing plastics and rubber). As the principal component of smog, it also reduces visibility.

Ozone is not directly released into the atmosphere, but is formed from the photochemical reactions of volatile organic compounds (VOC) and nitrogen oxides (NOx) in the presence of sunlight. It is the principle pollutant in smog. Because ozone formation is dependent upon sunlight, the highest concentrations occur typically in the early afternoon, from May through September. Currently, Palm Beach County is designated as being nonattainment with the NAAQS for the pollutant ozone.

> ◆ *"Ground level ozone is the primary pollutant responsible for smog."*

Ground level ozone which is harmful should not be confused with the beneficial ozone in the earth's ozone layer. The ozone layer is in a level of the upper atmosphere called the stratosphere, located about 9 to 25 miles above the earth. It filters out harmful ultraviolet radiation from the sun (known to cause skin cancer), thereby shielding the earth's surface. Very little mixing occurs between the lower atmosphere and the stratosphere.

Ground level ozone has been shown to cause a number of physiological and pathological changes in both humans and animals. At concentrations exceeding the standard, it causes decreases in lung capacity. Individuals participating in strenuous labor or rigorous physical exercise are particularly at risk. Symptoms include shortness of breath, chest pains or tightness, throat dryness, headache, and nausea. Also, asthmatics and those with pre-existing respiratory ailments may be more susceptible to attacks by ozone exposure.

There is also evidence that prolonged exposure to ozone will tend to retard lung clearance, and interfere with or inhibit the body's immune system. Research on the effects of chronic ozone exposure is ongoing.

▼*Particulate Matter*

Particulate matter is liquid or solid particles suspended in the atmosphere. Many natural sources contribute to suspended particulate matter such as soil, sand, mold spores, and pollens. Sources of man made particulate matter emissions include stationary fuel combustion, motor vehicle emissions, open burning, construction activities, and roadway traffic.

Particles that have an aerodynamic diameter of less than 10 micrometers (PM_{10}) are classified as "inhalable". This means that they can enter and be deposited in the lower respiratory system. In general, the smaller the particle, the more likely it can be deposited in the lower regions of the respiratory system. Deposition is also dependent on other physical and chemical characteristics of the particle.

> ◆ *"Health impacts due to particulate matter may be compounded in the presence of other pollutants, such as sulfur dioxide."*

Once a particle is deposited, the body's defense mechanism will attempt to clear it. Usually the deeper a particle is deposited in the respiratory system, the longer it will take to be cleared, and therefore, the longer the exposure to any toxic affect of the particle.

Exposure to high concentrations of particulate matter can contribute to the development of bronchitis and aggravate bronchial asthma. Children, smokers and individuals with pre-existing ailments are more likely to be susceptible. In the same manner, health impacts of particulate matter can be compounded with the synergistic effects of exposure to other pollutants such as sulfur dioxide.Suspended particulate matter in the atmosphere also reduces visibility and can damage materials.

▼*Sulfur Dioxide*

Sulfur dioxide (SO_2) is a colorless, nonflammable gas. At concentrations above 3 ppm the gas can be distinguished by its pungent irritating odor. Most sulfur dioxide emissions come from combustion sources, mainly power plants, burning fuels containing sulfur. When SO_2 is emitted into the air, it can combine with water to form sulfuric acid or other sulfate particles. It is also a major contributor to acid rain.

Sulfur dioxide primarily affects the upper respiratory system. It is usually removed by the nose, mouth and throat because of its solubility. Exposure to SO_2 can cause the bronchial tubes to constrict. Most individuals will be affected by SO_2 at concentrations of 5 ppm and above. However, some sensitive individuals, such as asthmatics, can show a response at concentrations as low as 0.25 ppm during vigorous exercise.

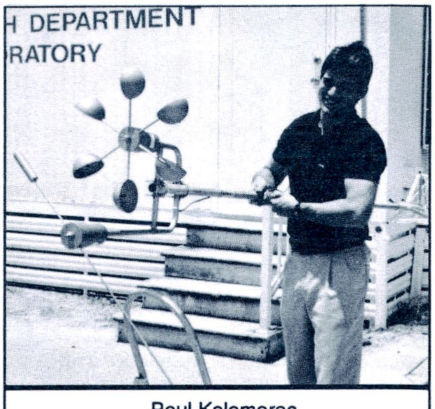
The overall health impacts of SO_2 are not limited to direct exposure to the gas. The health effects from exposure to sulfuric acid aerosols or other sulfate particles may be of greater consequence.

III. AIR QUALITY ASSESSMENT

▼*Meteorology*

Palm Beach County can be classified as a semi-tropical region. The near permanent position of the subtropical high pressure area dominates our weather. It causes the prevailing easterly surface winds and supplies the warm moist air necessary to produce the frequent evening rain showers and thunderstorms for which Southern Florida is known. The Atlantic Ocean borders the eastern edge of the county and the Gulfstream flows northward approximately three miles off-shore.

The subtropical high pressure area responsible for so much of the enjoyable weather in Palm Beach County is also capable of producing high pollution days. These days occur usually in December and January and result from cold northern air moving underneath the existing subtropical warm moist air. This results in a temperature inversion an increase in temperature with height. In effect, this traps pollutants in the lower atmosphere near ground level.



Paul Kalamaras
Environmental Specialist II

Afternoon sea breezes control the daytime weather for the eastern part of the county. Fronts form along the boundaries between hot western land breezes and slightly cooler moist eastern sea breezes. A distinct line of cumulus clouds develops just ahead of the sea breeze fronts. The combination of intense summer sun and very humid air aids in the formation of thunderstorms along and ahead of these fronts. These storms tend to move westward toward the inland areas. Occasionally, cold northern fronts will push this far south to produce severe showers and thunderstorms when confronted with the local area's warm moist air.

The county's "rainy season" lasts from May to October and coincides with The Hurricane Season from June 1st to November 31st. This wet weather is primarily due to the east-to-west movement of tropical weather systems from the Caribbean Sea and Atlantic Ocean. Dry northern winds may prevent this warm moist air from advancing farther north and lead to local area droughts. These winds may also help steer away most tropical cyclones. However, they can be overridden by strong southern winds and low pressure from the eastern Gulf of Mexico which produces heavy rainfall.

Seldom does a cold air mass reach this region without being diminished by marine influences and our southern location. However, occasionally in December and January strong northern winds will push frigid continental air down into the Florida peninsula. This produces the region's coldest weather, usually found in the Glades Area on the second night after a cold front. Frosts may occur if this weather persists for two to three days. The interior farmland receives a "freeze" about every third year.

Meteorological parameters play a significant role in understanding the overall air pollution cycle. Wind direction and speed are of primary importance — especially within the first few hundred feet of the surface — in determining pollutant dispersion and movement. The wind direction indicates the pathway of the contaminants. The wind speed reflects the travel time to a receptor and is a factor in the dilution of a pollutant.

Other "high pollution" episodes may occur in summer, from April to October. One high pressure system may center over the Gulf of Mexico while a second settles just off the southeast Florida coast. These competing systems create light surface winds prohibiting the development of sea breezes which would normally disperse pollutants in the lower 100 feet of atmosphere. Also, lower than normal rainfall during this period can cause dry, dusty conditions. This, combined with intense summer sunlight and stagnating high pressure systems, can cause higher than normal ozone levels (80% of 0.120 ppm). Meteorological data for Palm Beach County in 1991 is shown in Table III.1 on the following page.

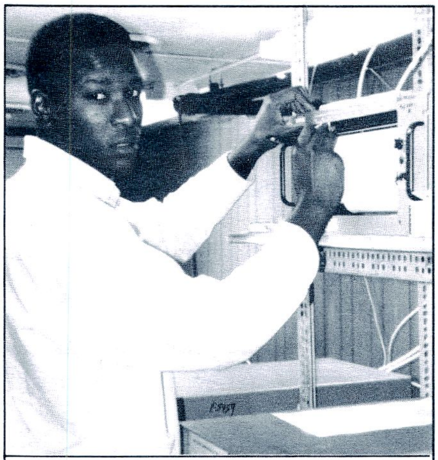
1991 ANNUAL METEOROLOGICAL DATA
Palm Beach County

Month	1951-1980 MEAN MAXIMUM TEMP.	1991 DAILY MAXIMUM TEMP.	1951-1980 MEAN MINIMUM TEMP.	1991 DAILY MINIMUM TEMP.	1951-1980 MEAN MONTHLY PRECIP.	1991 ACTUAL MONTHLY RAINFALL	1951-1980 MEAN WIND DIRECTION	1991 ACTUAL WIND DIRECTION	1951-1980 MEAN WIND SPEED	1991 ACTUAL WIND SPEED
January	74.50	78.50	55.90	63.50	2.71	10.43	NW	ESE	10.00	10.90
February	75.30	76.30	56.20	60.10	2.62	4.36	SE	NE	10.50	12.00
March	79.30	81.50	60.80	63.70	2.69	3.36	SE	S	10.90	13.60
April	82.50	81.70	65.10	70.10	3.21	9.54	E	ESE	10.80	13.40
May	85.70	86.10	69.50	74.20	6.02	8.94	ESE	ESE	9.90	12.90
June	88.10	89.40	72.70	74.30	7.92	7.45	ESE	ESE	8.30	8.30
July	89.70	91.20	74.20	75.20	6.06	7.16	ESE	SE	7.70	7.70
August	90.10	91.70	74.80	75.40	5.78	7.34	ESE	SE	7.70	7.60
September	88.40	89.00	74.30	75.00	9.29	6.44	ENE	ENE	8.70	8.10
October	84.40	85.30	70.10	72.20	7.77	7.58	ENE	ENE	10.20	10.70
November	79.60	79.20	63.50	63.80	3.39	2.32	ENE	NE	10.30	12.40
December	75.70	78.40	58.20	62.00	2.26	4.44	NNW	ENE	10.10	10.40
	MEAN	MEAN	MEAN	MEAN	TOTAL	TOTAL	MEAN	MEAN	MEAN	MEAN
YEARLY	82.78	84.03	66.28	69.13	59.72	79.36	ESE	E	9.59	10.67

TABLE III.1 Meteorological data was compiled from information recorded at the Palm Beach International Airport (NWS).

▼*Ambient Air Monitoring*

One of the most important functions of the HRS/Palm Beach County Public Health Unit's air program is to conduct ambient air monitoring.



Andrew Smith
Ambient Air Monitoring Section

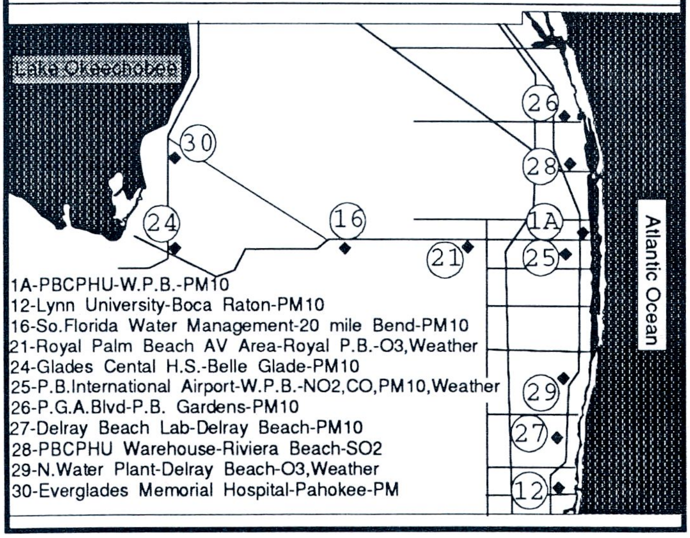
The data obtained is used to assess the overall air quality in Palm Beach County, and determines whether this area is in compliance with federal and state ambient air quality standards. Ambient air monitoring data is also used to evaluate the effectiveness of control strategies and the permitting program.

The monitoring is conducted throughout the county as indicated in Figure III.2, which identifies the location of the monitoring sites and the pollutants monitored. The monitoring is performed by highly trained and specialized staff utilizing state-of-the-art equipment. For the gaseous pollutants, sensitive instruments are used to detect concentrations in the sub parts per million range. These instruments run continuously except for servicing or maintenance. The data collected from these instruments is stored on data loggers and is routinely telecommunicated via modem to the central data acquisition computer located in West Palm Beach. After the air monitoring data has been reviewed and validated, it is telecommunicated to the Florida Department of Environmental Regulation which then forwards it to the U.S. Environmental Protection Agency.

All ambient air monitoring is conducted in strict accordance with federal and state quality control limits and procedures. It is the responsibility of the Health Unit's Quality Assurance Section to ensure that these requirements are met. The following sections describe the types and locations of monitors for each pollutant.

Palm Beach County Ambient Monitoring Stations

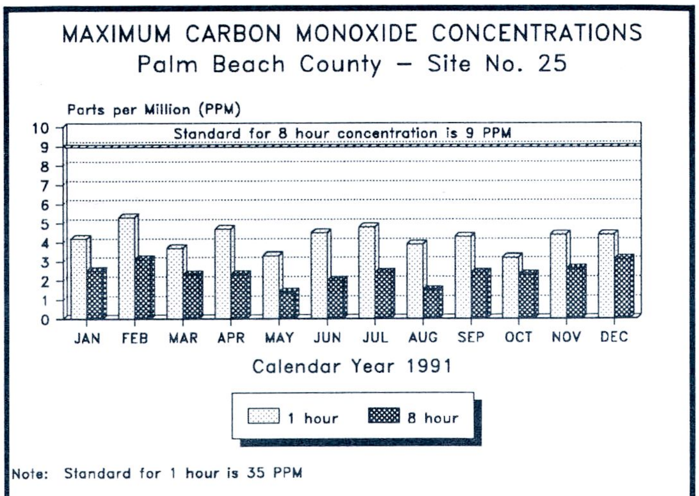
FIG III.2



1A-PBCPHU-W.P.B.-PM10
12-Lynn University-Boca Raton-PM10
16-So.Florida Water Management-20 mile Bend-PM10
21-Royal Palm Beach AV Area-Royal P.B.-O3,Weather
24-Glades Cental H.S.-Belle Glade-PM10
25-P.B.International Airport-W.P.B.-NO2,CO,PM10,Weather
26-P.G.A.Blvd-P.B. Gardens-PM10
27-Delray Beach Lab-Delray Beach-PM10
28-PBCPHU Warehouse-Riviera Beach-SO2
29-N.Water Plant-Delray Beach-O3,Weather
30-Everglades Memorial Hospital-Pahokee-PM

▼*Carbon Monoxide (CO)*

The carbon monoxide monitoring station in West Palm Beach is located just south of Belvedere Road, a major arterial, and just north of Palm Beach International Airport. To determine maximum CO concentrations, the monitors are typically located near roadways as the major source of this pollutant is from motor vehicle emissions. Figure III.3 indicates the maximum one hour and eight hour concentrations for each month as compared to the respective standard. There have been no exceedances of the standards recorded in Palm Beach County.


MAXIMUM CARBON MONOXIDE CONCENTRATIONS
Palm Beach County – Site No. 25

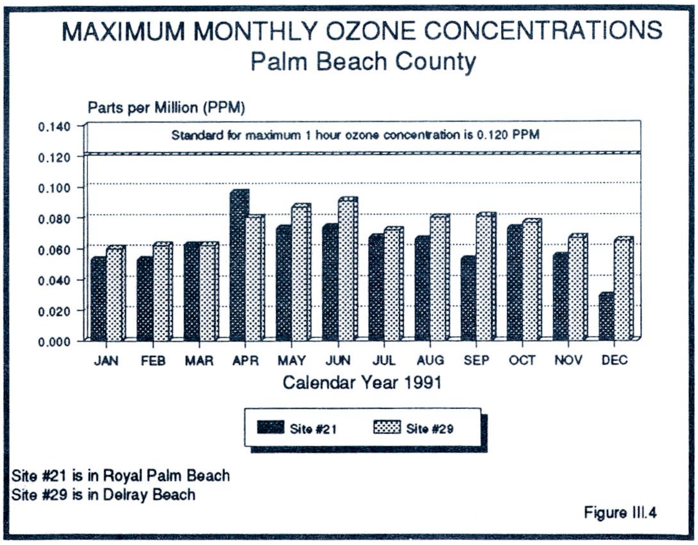
Note: Standard for 1 hour is 35 PPM

Figure III.3

Highest CO concentrations usually occur on winter mornings. This coincides with peak traffic schedules, the coldest days, and weather conditions leading to a thermal inversion. Under these conditions, CO emissions are trapped near the ground, providing monitors with the highest readings.

▼*Nitrogen Dioxide (NO_2)*

Nitrogen dioxide is also measured at the West Palm Beach air monitoring station. As indicated in Figure III.4, values are well within the standards.

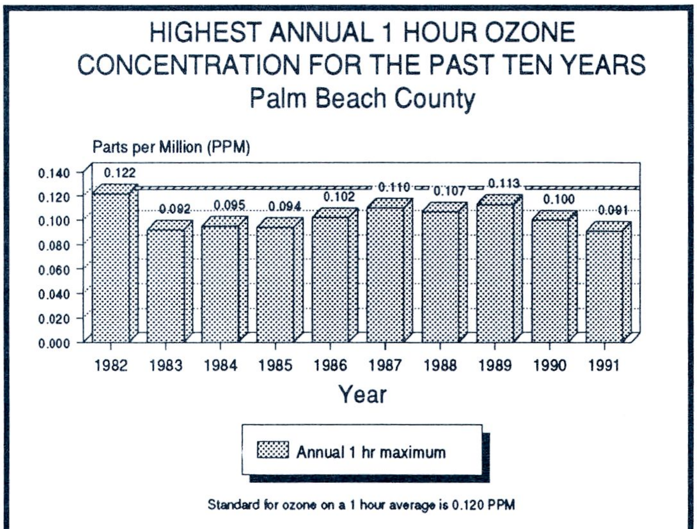

MAXIMUM MONTHLY OZONE CONCENTRATIONS
Palm Beach County

Site #21 is in Royal Palm Beach
Site #29 is in Delray Beach

Figure III.4

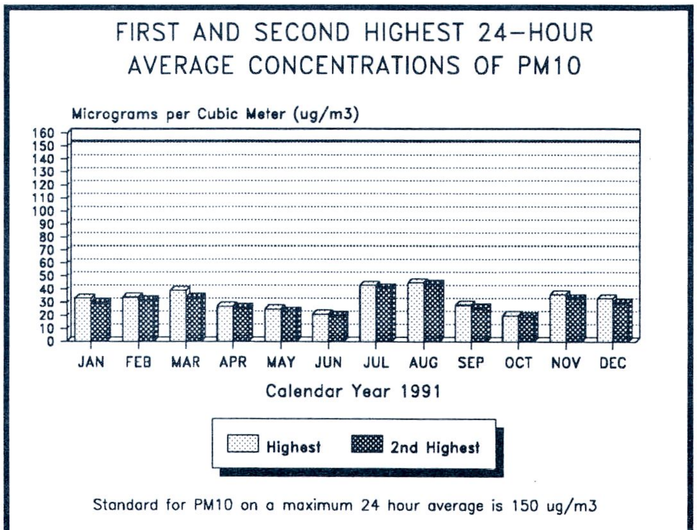
▼*Ozone (O_3)*

Ozone monitoring is conducted in Royal Palm Beach (site No. 21) and in Delray Beach (site No. 29). These sites are designated as national air monitoring stations (NAMS). Figure III.5 indicates the maximum hourly average concentrations for each month compared to the ozone standard of 0.120 parts per million. Highest ozone values typically occur in the late spring and summer months. Figure III.6 identifies the highest ozone values recorded in Palm Beach County for the last 10 years. Although there have been no exceedances of the ozone standard for this period, Palm Beach County is designated as being nonattainment with the ozone standard. The Environmental Protection Agency has determined that Dade, Broward and Palm Beach Counties are part of same consolidated metropolitan statistical area (CMSA). The ozone levels have exceeded the standard only in Dade and Broward counties.


HIGHEST ANNUAL 1 HOUR OZONE CONCENTRATION FOR THE PAST TEN YEARS
Palm Beach County

Standard for ozone on a 1 hour average is 0.120 PPM

Figure III.5


FIRST AND SECOND HIGHEST 24-HOUR AVERAGE CONCENTRATIONS OF PM10

Standard for PM10 on a maximum 24 hour average is 150 ug/m3

Figure III.6

▼Particulate Matter (PM)

Particulate matter is monitored by employing high volume air sampling through a filter. The samplers are equipped with inlets to exclude particles greater than 10 microns (µm) in diameter. Therefore, only particles with diameters equal to or less than 10µm (the inhalable fraction) are collected on the filter.

The PM_{10} samplers operate for 24 hours every six days on a specified schedule. After each operation, the PM_{10} samplers are serviced and the filters changed. The exposed filters are returned to the laboratory for analysis.

The Health Unit operates eight sites equipped with PM_{10} samplers; six are designated as state and local air monitoring sites (SLAMS) and two as special purpose monitoring sites (SPM). Figure III.6 indicates the highest and second highest 24 hour average values for each month with the corresponding station as compared to the standard of 150µg/m3. Figure III.7 shows the 24 hour annual average for each station compared to the standard of 50µg/m3. Particulate matter concentrations tend to be elevated during conditions of dry weather and heavy winds.

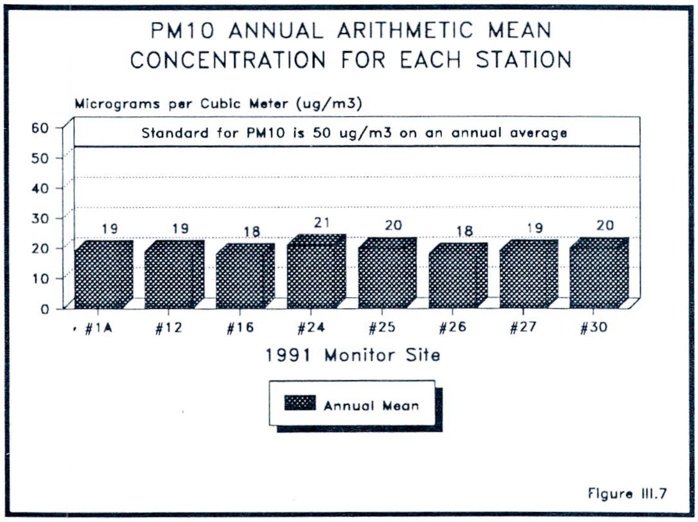


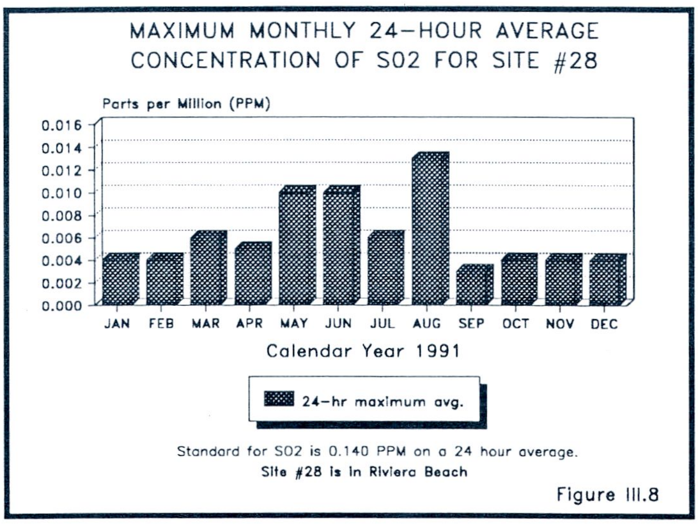
Figure III.7

In 1991, the Health Unit began employing new technology to monitor PM_{10} on a continuous basis. A beta PM_{10} monitor was acquired and placed at site No.25. The data from this monitor is telecommunicated to the data acquisition system in West Palm Beach. This data is then used for determining the daily air quality index.

At the request of the U.S. Environmental Protection Agency, the Health Unit also utilized these instruments for monitoring PM_{10} in the Glades Area during the 1990-1991 sugar cane burning season. Two sites were set up; one in Belle Glade and the other Pahokee. Both sites were located close to sugar cane fields and a sugar mill. The advantage of using the beta PM_{10} monitors is that monitoring can be conducted on a continuous daily basis rather than once every six days. The results of the monitoring indicated no violations of the PM_{10} standards. Monitoring at the Belle Glade site was continued throughout 1991.

▼Sulfur Dioxide (SO_2)

Sulfur dioxide is monitored at one site located in Riviera Beach. This site is downwind of prevailing winds from the FPL Riviera Power Plant which is the major source of SO_2 emissions in Palm Beach County. However, it can be seen in Figure III.8 that measured SO_2 concentrations are well within ambient air quality standards. This pollutant is not of major concern in Palm Beach County.



Standard for SO2 is 0.140 PPM on a 24 hour average.
Site #28 is in Riviera Beach

Figure III.8

▼Air Quality Index

The Air Quality Index (AQI) is a uniform method of reporting daily air pollution concentrations and the associated health effects. The index is derived from the highest value of the five major pollutants monitored by the Health Unit: particulate matter, ozone, sulfur dioxide, oxides of nitrogen, and carbon monoxide. In Palm Beach County, particulate matter and ozone are the two predominate pollutants.

The AQI is based on the National Standard Scale spanning from 0-500 with a corresponding description range of:

1 - 50	GOOD
51 - 100	MODERATE
101 - 199	UNHEALTHY
200 - 299	VERY UNHEALTHY
300 - 500	HAZARDOUS

Air quality in Palm Beach County is in the GOOD range 90% of the time and in the MODERATE range less than 10%. MODERATE air quality episodes of particulate matter may occur throughout the year, usually the result of heavy construction activity and dry weather. Ozone levels approaching the MODERATE range usually occur during the afternoon hours of spring, summer, and fall. Stagnant weather conditions may also contribute to MODERATE level episodes. Figures III.9 and III.10 show the morning and afternoon air quality index for Palm Beach County. The air program staff produces a recorded message for the morning and afternoon AQI on Monday through Friday. For the latest update of the Air Quality Index, call (407) 355-3962.

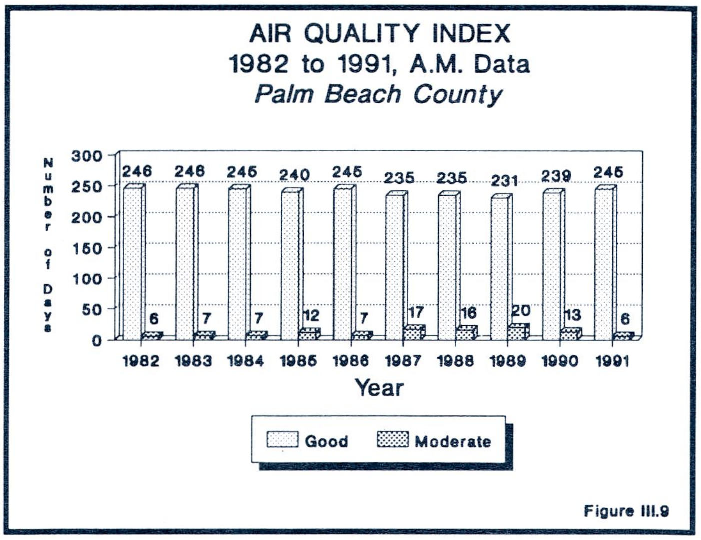


Figure III.9

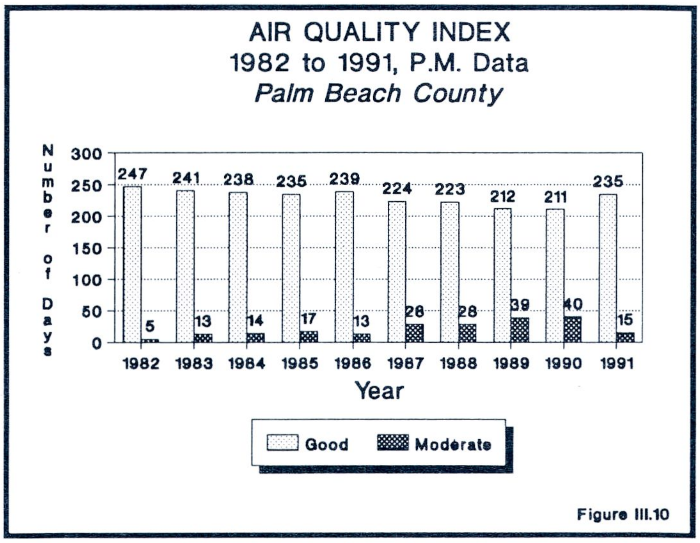


Figure III.10

▼*Pollen and Mold Spore Count*

The HRS/Palm Beach County Public Health Unit also provides a pollen and mold spore count. The pollen count is given a numerical value based on the amount and type of pollen collected in a 24-hour period. Data is reported in "grains of pollen or mold spores per cubic meter of sampled air." This count is compared to the following scale developed by the American Academy of Allergy and Immunology Aerobiology Committee:

0 - 20	Low Count
21 - 200	Moderate Count
+200	High Count

There is no standard numerical scale for mold spores at this time. As new data becomes available, more meaningful scales can be developed and published. The instrument used to measure the pollen/mold spore count is called a "Roto-Rod Sampler" and is the standard sampling device.

Figure III.11 provides information on the average monthly pollen and mold spore count for the year. The predominate contributors to the pollen count are grass and weed pollen (May to October) and tree pollen (December to April). The mold spore count is affected by rainfall, generally increasing immediately after a storm and decreasing during dry periods. Palm Beach County receives the greatest amount of rainfall from May through October.

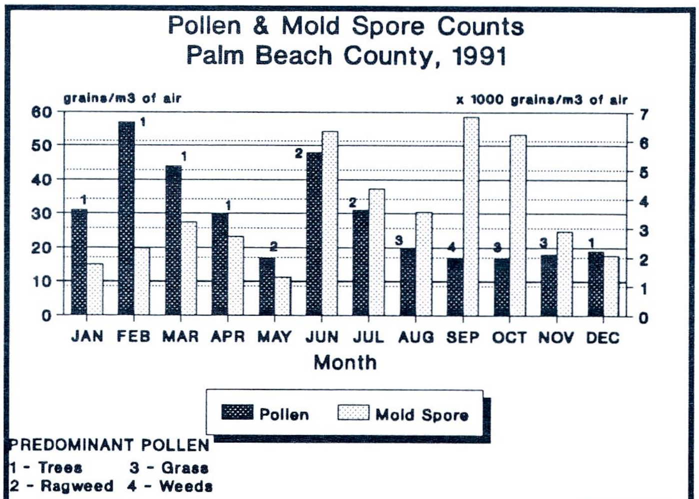
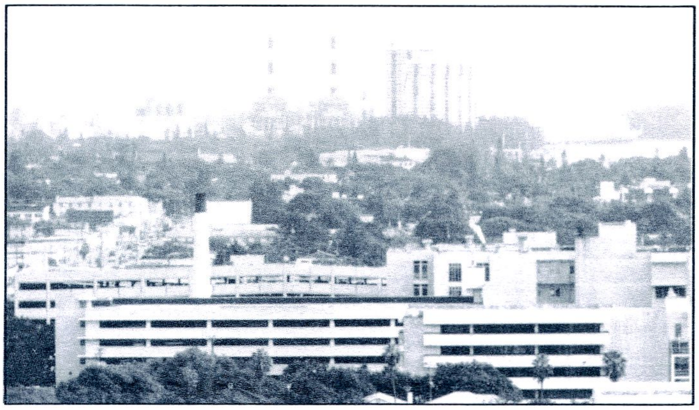


Figure III.11

The HRS/PBCPHU updates the Air Quality Index and the Pollen/Mold Spore Count daily at 11:00 a.m. and 3:00 p.m. For the latest update, call (407) 355-3962.

IV. SOURCES OF AIR POLLUTION

Air pollution is primarily caused by man's industrial and transportation activities. It is the undesired by-product of the technological advancement of our modern society. On the other hand, this modern society has also developed efficient methods to prevent and control atmospheric emissions of air pollutants. Emission contributions can be classified by three main categories of air pollution: stationary, mobile, and area sources. Figure IV.1 shows the contributions of each of these categories for the criteria pollutants.



TOTAL POLLUTANT EMISSIONS

Palm Beach County

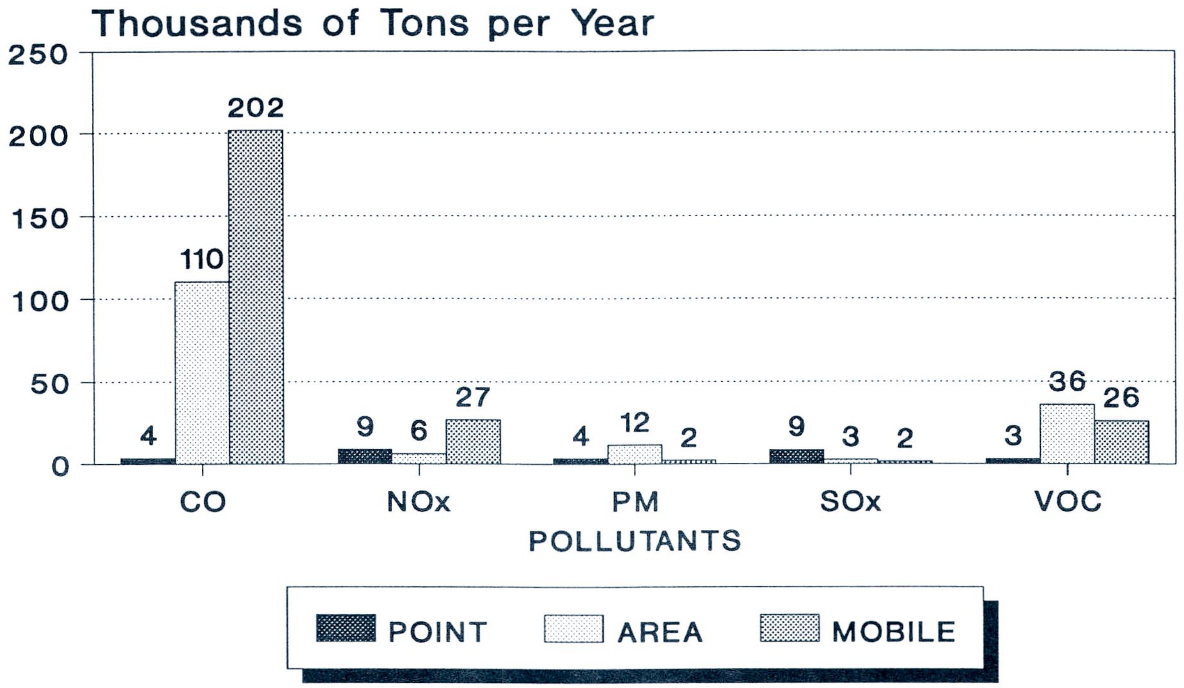
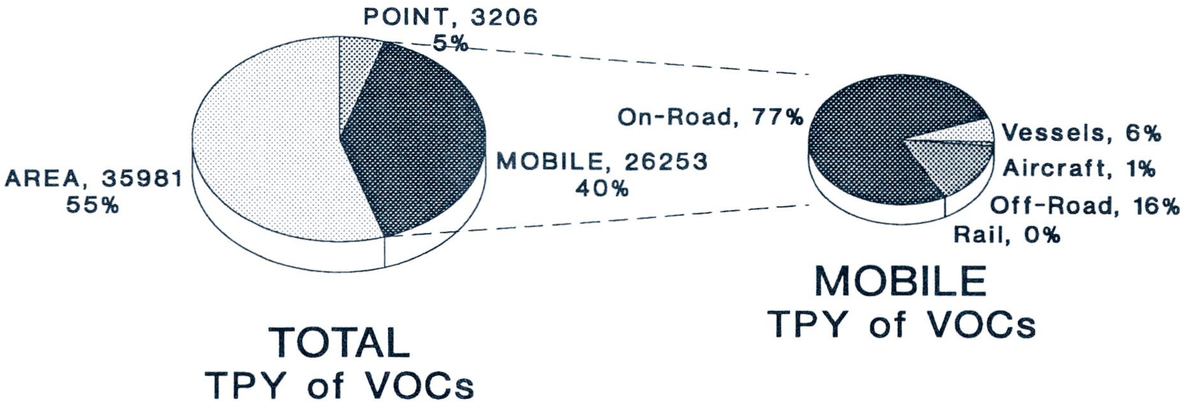


Figure IV.1

VOLATILE ORGANIC COMPOUNDS (VOCs)

Sources of Emissions

Palm Beach County



VOCs contribute to the formation of ground level ozone. Ozone is also known as photo-chemical smog. Palm Beach County is an EPA nonattainment area for the pollutant ozone.

Figure IV.2

▼*Stationary Sources*

The major stationary sources of air pollution are most often industrial and are usually characterized by smoke stacks. In eastern Palm Beach Beach County, the major stationary sources that emit over 100 tons of any one pollutant are: two electric power plants (FPL Riviera Beach and Lake Worth Utilities) and a municipal waste combustor (Solid Waste Authority North County Regional Resource Recovery Facility). In western Palm Beach County, the major sources of air pollution are sugar mills. However, these mills only operate during the sugar cane harvesting season, which generally runs from October through March.

Other significant stationary sources involving combustion processes include biomedical waste incinerators, asphalt plants and commercial or industrial boilers. Several source categories have significant emissions of volatile organic compounds (VOC). These include bulk gasoline plants, miscellaneous metal coating operations, polyester resin (fiberglass) fabrication and electronic manufacturing. A major aircraft testing and manufacturing facility located in Palm Beach County (United Technologies) also emits significant quantities of VOCs. Stationary sources of particulate matter include two portland cement terminals and numerous concrete batch plants.

Stationary sources generally reduce the amount of pollutants released into the ambient air through the installation of control equipment. Emissions can also be reduced through process changes which provide for more efficient operations, or by using cleaner fuels, or alternate coatings and solvents.

▼*Mobile Sources*

Mobile sources such as cars, planes, trains and boats are the major contributors to our region's air pollution problems. Emissions from mobile sources, (mainly light duty gasoline powered vehicles) contribute about 40% of the precursors of ozone formation. The large number of both automobiles and trucks is creating a burden on the existing transportation network, thereby making control of these sources very difficult. Motor vehicle emissions can be controlled by keeping the vehicle pollution control devices in working order, and performing regularly scheduled engine maintenance. More efficiently operating vehicles and those operating on clean fuels (hydrogen, compressed natural gas, and electricity) can also reduce air pollution.

◆ *"Mobile sources contribute almost 50% of the total pollution produced in Palm Beach County."*

Mobile source pollution can also be reduced by providing a transportation network that minimizes congestion, and reduces the number of vehicle miles traveled (VMT) by developing and improving utilization of mass transit systems. The Tri-County Commuter Rail (a commuter train that runs 67 miles between West Palm Beach and Miami) is a good example of a "transportation control measure" (TCM) to reduce VMT. Car and van pooling, flexible/staggered work hours, and preferential treatment for high occupancy vehicles are examples of other TCMs.

▼*Area Sources*

Area sources are geographic localities with pollution problems stemming from the combined effects of various activities. Palm Beach County has many sources which emit small quantities of air pollutants; collectively their impact is significant. This includes small point sources which are too small and/or too numerous to be surveyed and characterized individually. Dry cleaners, gasoline stations, open burning of land clearing debris, consumer solvents, architectural coatings, and dust from construction activities are just a few examples of area sources.

▼*Emission Inventory*

A comprehensive emission inventory is an essential tool for any air pollution regulatory agency. The inventory provides information for the design of an ambient air monitoring program, identifies the relative contribution of the various pollution sources, and provides data for the development of control strategies and regional planning. A number of factors are used in compiling an emission inventory including fuel usage figures, process information, and accepted emission factors. Although the methods and factors are somewhat limited in precision, the emission inventory nevertheless, provides sufficient accuracy for the purpose and intent. The emission inventory in this report represents calculated emissions from major stationary point sources, and generalized estimates of emissions from mobile sources and area sources (Table IV.2).

1991 ANNUAL REPORT EMISSION INVENTORY SUMMARY

SOURCES OF EMISSIONS

EMISSIONS

TOTAL EMISSIONS (Tons Per Year)

Table IV.3	CO	NOx	PM	SOx	VOC
•Storage, Transportation & Marketing of Petroleum *Products and Volatile Organic Liquids (VOL)*	**0.0**	**0.0**	**0.0**	**0.0**	**2262.9**
Bulk Gasoline Plants	0.0	0.0	0.0	0.0	51.0
Barges,Tankers,Tank Trucks & Rail Cars in Transit	0.0	0.0	0.0	0.0	90.4
Service Station Loading (Stage I)	0.0	0.0	0.0	0.0	117.6
Vehicle Refueling (Stage II)	0.0	0.0	0.0	0.0	2003.9
•Industrial Processes	**3110.4**	**2068.6**	**2928.3**	**1049.8**	**3121.9**
Plastic Products Manufacture	0.0	0.0	0.0	0.0	28.9
Concrete Terminals	0.0	0.0	8.4	0.0	0.0
Concrete Batch Plants	0.0	0.0	325.5	0.0	0.0
Asphalt Batch Plants	10.3	9.8	5.4	46.7	7.6
Sugar Mill Processing	3100.1	2058.8	2589.0	2182.4	3085.4
•Industrial Surface Coating	**0.0**	**0.0**	**0.0**	**0.0**	**2631.3**
Metal Coils	0.0	0.0	0.0	0.0	220.8
Metal Furniture	0.0	0.0	0.0	0.0	883.0
Miscellaneous Metal Parts and Products	0.0	0.0	0.0	0.0	951.5
Flatwood Products	0.0	0.0	0.0	0.0	132.5
Plastic Products	0.0	0.0	0.0	0.0	264.9
Large Ships	0.0	0.0	0.0	0.0	88.3
Large Aircraft	0.0	0.0	0.0	0.0	90.3
•Non-Industrial Suface Coating	**0.0**	**0.0**	**0.0**	**0.0**	**3267.3**
Architectural Coatings	0.0	0.0	0.0	0.0	2031.0
Auto Refinishing	0.0	0.0	0.0	0.0	1015.5
Traffic Paints	0.0	0.0	0.0	0.0.	220.8
•Other Solvent Use	**0.0**	**0.0**	**0.0**	**0.0**	**11309.4**
Degreasing	0.0	0.0	0.0	0.0	1897.5
Dry Cleaning	0.0	0.0	0.0	0.0	793.3
Graphic Arts	0.0	0.0	0.0	0.0	574.0
Adhesives	0.0	0.0	0.0	0.0	132.5
Cutback Asphalt	0.0	0.0	0.0	0.0	163.4
Consumer/Commercial Solvent Use	0.0	0.0	0.0	0.0	2781.6
Pesticide Application	0.0	0.0	0.0	0.0	4967.1
•External Combustion Sources	**110754.2**	**12835.1**	**12311.0**	**10399.4**	**16249.8**
Industrial Fuel Combustion	150.3	724.6	37.3	2055.9	10.7
Electrical Generation	399.4	5346.0	617.1	7422.7	41.4
Commercial/Institutional Fuel Combustion	56.9	316.8	19.3	604.6	10.9
Residential Fuel Combustion	26.2	123.4	7.6	65.7	6.3
Resource Recovery Facilities	72.1	1104.0	16.9	249.0	1.8
Sugar Cane Fields	99739.6	4925.4	10343.4	0.0	14776.2
Land Clearing	2165.8	61.9	263.0	0.0	293.9
Structure Fires	90.2	2.1	24.0	1.5	16.5
Auto Fires	2.9	0.1	2.4	0.0	0.8
Brush Fires	19.0	0.9	3.4	0.0	2.0
Wildfires	23.8	1.1	4.2	0.0	2.5
Controlled Burns	8008.0	228.8	972.4	0.0	1086.8
•Stationary Internal Combustion	**82.0**	**299.9**	**11.1**	**3.8**	**10.1**
Reciprocating Engines	4.7	21.7	1.5	1.4	1.5
Gas Turbines	77.3	278.2	9.6	2.4	8.6
•Waste Disposal	**0.0**	**0.0**	**0.0**	**0.0**	**333.9**
Publicly Owned Treatment Works (POTWs)	0.0	0.0	0.0	0.0	284.1
Municipal Landfills	0.0	0.0	0.0	0.0	49.8
•Mobile Sources	**201860.6**	**26838.2**	**2192.5**	**1519.5**	**26252.9**
Highway Vehicles	154796.5	22119.0	2178.4	1441.8	20257.5
Non-Highway Vehicles					
Non-Road	40382.4	4160.7	0.0	0.0	4125.1
Aircraft	1616.8	375.3	0.0	20.0	252.2
Rail	77.8	104.0	14.1	43.2	28.2
Vessels	4987.1	79.2	0.0	14.5	1589.9
•TOTAL EMISSIONS - Palm Beach County	**315807.2**	**42041.8**	**17442.9**	**14151.8**	**65439.5**

V. AIR POLLUTION CONTROL ACTIVITIES

The Air Pollution Control Section of the HRS/Palm Beach County Public Health Unit is responsible for permit review, stationary source inspections, enforcement, the mobile source program, asbestos tracking, indoor and outdoor air pollution, air pollution complaints, and open burn approvals. Each of these programs are described below. See Table V.1 for the activity summary of each component.

Palm Beach County
1991 Activities Summary

AIR POLLUTION PERMIT REVIEW	
Construction Permits.	22
Operating Permits	15
Renewal Permits.	39
Modifications	17
STATIONARY SOURCE INSPECTIONS	
Major.	41
Minor.	70
ENFORCEMENT	
Notice of Violation.	19
Notice to Correct.	18
Environmental Control Hearing Board Cases.	11
•Penalties Collected.	$ 3100
Warning Notices	29
Consent Orders	7
•Penalties Collected.	$ 12,680
MOBILE SOURCE PROGRAM	
Inspections, Used Car Lot.	23
Stage I Vapor Recovery, Facility.	340
Stage I Vapor Recovery, Delivery.	32
Emission Testing.	6
Presentaions.	71
Investigations	46
Review	
Stage I Vapor Recovery Plans.	21
Development of Regional Impact (DRI).	10
Tampering/VE Complaints.	51
MVIP Audit.	6
ASBESTOS	
Notifications.	394
Demolitions..	130
Approvals.	102
Inspections.	451
COMPLAINTS	723
Odor.	126
Smoke/Open Burning.	135
Noise.	20
Dust	105
Paint Overspray/Chemical Fumes.	87
Asbestos.	6
Indoor Air Section.	244
OPEN BURN APPROVALS	
Commercial	106
Residential	169

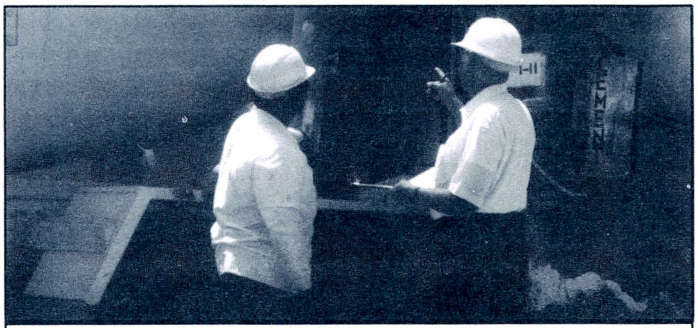
TABLE V.1 1991 Activity Summary of the Air PollutionControl Section

Permitting

Large stationary sources of air pollution are required to obtain permits from the Florida Department of Environmental Regulation (FDER). Copies of permit applications, renewals, and modifications are sent to the Health Unit. The air pollution control staff reviews the documents to determine whether the facility meets current state and federal environmental regulations. Comments and recommendations are forwarded to FDER. If issued, a permit then becomes a legal agreement between the pollution source and the state concerning equipment, materials, processing, operation and air pollution emissions.

Inspection and Compliance

Field compliance inspections are performed to insure adherence to permit conditions and environmental regulations. There are three main types of compliance activities:



Ken Bryson - Concrete Batch Plant Inspection

Annual Facility Inspections are performed each year for all permitted sources in Palm Beach County. These inspections include a physical tour of the facility emphasizing stack emissions, air pollution control equipment, fuel usage, fugitive emissions, recordkeeping and general facility conditions. The operating permit is reviewed and notes are made of any equipment, material, or process changes made during the past year.

Compliance Stack Tests are required by some permits to verify that a facility is in compliance with the permit's specific conditions on emission limits. Palm Beach County inspectors witness all stack tests to insure that standard test procedures are followed.

Complaint Response Investigations are performed to determine whether a facility is responsible for causing a public complaint. Stack and fugitive emissions are observed. If a complaint is valid, an inspector may perform a detailed inspection to find the cause of the excess emissions. This may involve many of the same procedures used for an annual facility inspection. Inspection reports are added to the source files which contain permit, compliance, complaint, and enforcement information. Inspections are also logged into the DER's computerized database. Unsatisfactory inspections would lead to some level of enforcement action.

▼Complaints

Perhaps the most important function of the Air Pollution Control Section is to respond to citizen complaints. This provides a direct service to the public and alerts the Health Unit to problem areas. It is a policy that all air pollution complaints be investigated in a timely manner and resolved or referred to the appropriate party. The Air Pollution Control Section responds to numerous complaints throughout the year including smoke, odors, dust, and paint and pesticide overspray.

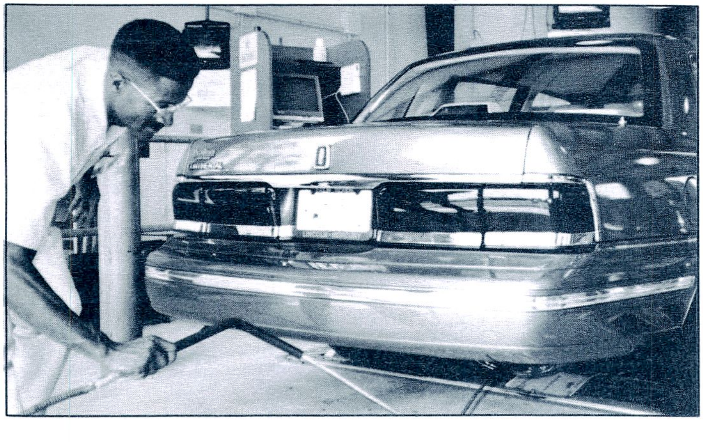
▼Enforcement

A key element for successful compliance is a good enforcement program. Sources found out of compliance with permit conditions or state air regulations can be brought before the Palm Beach County Environmental Control Hearing Board. This board is a quasi-judicial regulatory body established by the Palm Beach County Environmental Control Act. The board holds public hearings for cases of non-compliance with environmental regulations. Alternatively, Florida statutes allow approved local programs, such as the Health Unit's, to pursue civil penalties up to $10,000 per day, per violation.

▼Mobile Source Program

The Mobile Source Program is responsible for implementing regulations designed to control emissions from cars, trains, planes and boats — more commonly referred to as mobile sources. This is accomplished with regular inspections and aggressive enforcement by highly trained personnel. Used car lots, gasoline service stations, automotive service and repair facilities, and gasoline delivery vessels are a few of the local sources subject to compliance activities. A comprehensive "Emissions Inventory" is compiled annually for mobile sources.

The Mobile Source Program also assists the Department of Highway Safety and Motor Vehicles in the Motor Vehicle Inspection Program (MVIP). This is accomplished by providing technical assistance and conducting quality assurance audits on the instruments used for testing at the inspection stations.



Other "indirect sources" are evaluated and monitored through the Development of Regional Impact (DRI) review process and coordinated with the Treasure Coast Regional Planning Council (TCRPC). These sources include any large scale development projects which would increase traffic and, indirectly, air pollution.

The Mobile Source Program is also very involved with the transportation planning process at the local level, holding membership in the Metropolitan Planning Organization's (MPO's) Technical Advisory Committee and Bicycle Advisory Committee and the statewide Transportation Control Measures (TCMs) Task Force.

The MPO is responsible for the long range transportation planning in the county. Planning efforts focus on promoting TCMs such as car and van pooling, flexible work hours, mass transit systems, public/private partnerships to increase urban mobility, and the integration of all modes of transportation. Many strategies are aimed at changing the individual's driving habits and decreasing single occupant vehicle trips. This will reduce the overall vehicle miles travelled, conserve fuel resources, reduce dependence on foreign oil and, ultimately, improve our air quality.

▼Asbestos

Asbestos exposure has been shown to cause a number of diseases including asbestosis, lung cancer and mesothelioma, a rare and usually fatal cancer. The health risks associated with asbestos have resulted in federal regulations contained in the National Emission Standards for Hazardous Air Pollutants (NESHAP). The HRS/Palm Beach County Public Health Unit is the lead agency for enforcing these regulations in Palm Beach County. The NESHAP regulations include notification requirements and standards for the handling and disposal of asbestos containing materials. The Health Unit issues written approvals for asbestos abatement projects, and conducts inspections to ensure that all NESHAP requirements are being adhered to as well as other applicable federal and state regulations for this activity. The PBCPHU also routinely inspects buildings to verify that there will be no threat of asbestos fibers being released into the air during demolition activities.

Walt Richards - Asbestos Coordinator

▼*Open Burning*

In Palm Beach County, the open burning of vegetative debris is allowed for land clearing purposes. This activity is a one-time operation associated with clearing a property for the construction of a commercial business or private residence. To minimize the air pollution generated by this activity, the Health Unit inspects all commercial and residential land clearing open burning projects. After an inspector verifies that the proposed project will meet all applicable air pollution regulations, the Health Unit issues an approval letter. The approval letter is required by Palm Beach County Fire Rescue and the municipal fire departments in order to issue a burn permit for the construction site. The Health Unit and the fire departments work closely together to monitor all open burns. Any project creating a nuisance or health threat will be suspended and enforcement action pursued.

▼*Indoor Air Section*

Recent energy conservation measures have resulted in efficient, well-insulated buildings and homes. Unfortunately, these measures also contribute to the build-up of many indoor air contaminants which may lead to illness such as "tight" or "sick" building syndromes. Occupants in such buildings may suffer from lethargy, headaches, stuffy noses, and irritations of the eyes and throat.

Most sources of indoor air pollution come from inside the building itself, for example:

- Volatile Organic Compounds (VOCs) from new carpets, adhesives, and cleaning compounds
- Ozone from copying machines
- Formaldehyde vapors from insulation and particle boards
- Mildewcides (paraformaldehydes, camphor, and paradichlorobenzene)

However, outside air can also play an important part in indoor air pollution, due to infiltration. Sources of outside air pollution include carbon monoxide from vehicle exhausts and hydrogen sulfide from sewer gas building exhausts. Many of these indoor air quality problems result from inadequate ventilation, chemical contamination, and bacterial or fungal contamination. Regardless of the source or cause, high concentrations of these contaminants can pose a potential health threat. In response to this threat, the Health Unit established an Indoor Air Section within the Division of Environmental Health.

This section conducts surveys and investigations of all health-related complaints inside private homes and commercial buildings. Upon request, this program provides free consultation, air flow assessments, and environmental sampling to locate the air pollution source. It is then possible to identify suspected contaminants with a wide range of state-of-art equipment. Once the indoor air problem is identified, the Health Unit will provide recommendations or refer the client to other qualified agencies or experts.

VI. PUBLIC INFORMATION

A Public Information Program (PIP) is also provided by the HRS/PBCPHU Air Section to better inform the public and affected sources of compliance requirements and the dangers of air pollution. The focus of this program is on pollution prevention; establishing a "pro-active" approach rather than assuming a "reactive" posture. Presentations are routinely provided to businesses, automobile trade associations and even to local elementary school children.

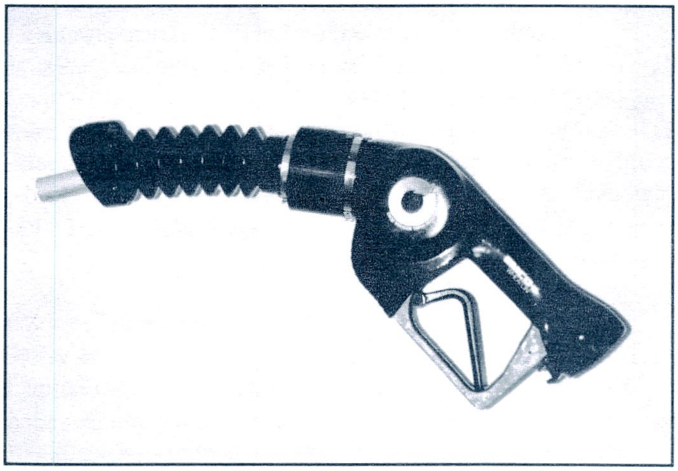
An example of a PIP is the "Environmental Problems and Conservation Solutions" program which was jointly developed by the Health Unit and the American Lung Association of Southeast Florida. This program is designed for young students and attempts to raise their awareness towards protecting the environment through conservation of natural resources. In 1991, the program was presented in many public and private schools throughout the county. It was also presented to civic groups such as the Boy and Girl Scouts of America, the Audubon Society and local rotary clubs. Whenever possible, arrangements are made with the local media/press to cover PIP activities during special events such as Clean Air Week, Car Care Month and annual Earth Day festivities.

HRS
Palm Beach County Public Health Unit

VII. NEW DEVELOPMENTS

▼*New Clean Air Act Requirements*

One of the main focuses of the Health Unit's air program for 1991 was to evaluate the 1990 Clean Air Act Amendments (CAAA) and their impacts to Palm Beach County. As a result of the CAAA, the Dade-Broward-Palm Beach County airshed was officially designated in 1991 as a "moderate" ozone nonattainment area. The designation was based on the extent to which the reported ozone values in the tri-county area exceeded the standard during the three year period covering 1987-1989. With a moderate designation, the three county area must demonstrate attainment of the ozone standard by November, 1996. The CAAA also requires a reduction of Volatile Organic Compound (VOC) emissions during this six year period.



One measure that will contribute significantly to VOC reductions is the Motor Vehicle Inspection Program (MVIP) which began operation in April 1991. In Palm Beach County, motor vehicles are responsible for about 45% of the VOC emissions. It is estimated that 10% of the vehicles with the highest emissions can contribute to over 50% of the mobile source VOC emissions. The MVIP will identify these vehicles with excessive emissions through annual inspections and require them to be repaired prior to registration renewal.

Another control measure required by the CAAA is Stage II Vapor Recovery. During gasoline refueling of motor vehicles, the air that is displaced from the fuel tank is saturated with gasoline. It is estimated that 700,000 gallons per year of gasoline are emitted into the air in Palm Beach County from refueling operations without vapor recovery. With Stage II Vapor Recovery, fuel pumps will be equipped with special nozzles that collect the vapor laden air during refueling and return it to the underground storage tank from which the fuel is being withdrawn. Those vapors are then collected by truck tankers during fuel delivery (Stage I Vapor Recovery). The truck tankers return to the terminal where the vapors are collected and recovered as fuel or processed through a vapor incinerator. Gasoline vapors also have components which are considered hazardous air pollutants and some have been identified as cancer causing, such as benzene. Stage II Vapor Recovery will provide the added benefit of reducing exposure to these hazardous air pollutants during refueling.

The HRS/Palm Beach County Public Health Unit is also evaluating other control options. Another measure which will provide significant VOC reductions is reformulated "clean" gasoline. The CAAA specifies that the nine U.S. cities with the worst air quality begin using reformulated gasoline by 1995. There is also a provision that other ozone nonattainment areas can option in to this program depending on the availability of the fuels. Reformulated gasoline will be cleaner because it will be further refined to produce less VOCs and toxic air pollutants. While reformulated gas could cost from 5 to 15 cents more per gallon than conventional gas, benefits such as less engine maintenance and tune-ups should offset the costs to the consumer.

Another control measure the Health Unit is promoting is the use of compressed natural gas (CNG) as an alternative fuel, especially for fleet vehicles. CNG is a widely available fuel that burns much cleaner than gasoline. It is domestically produced so using CNG will help reduce oil imports. CNG is also much cheaper than gasoline on an equivalent energy unit basis. Automobiles operate safely and perform well using CNG and with less maintenance requirements than gasoline vehicles. Gasoline operated vehicles can be easily converted to operate on this alternative fuel, either on a dedicated or dual fuel mode. The use of CNG is ideal for fleet vehicles that accumulate a lot of driving miles. The reason is conversion costs can be recovered from fuel savings over a shorter period of time.

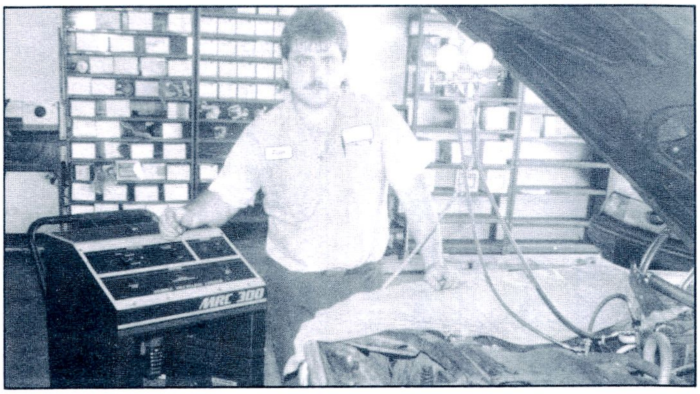
Not all VOC reductions will be realized from mobile sources. For example, the CAAA also requires EPA to reduce VOCs in some consumer products. These products include such items as paints, solvents, cleaning solutions and personal products like deodorants and hair sprays. The EPA will also develop control guidelines to regulate new source categories such as autobody refinishing, wood furniture coating, and plastic parts coating. Additionally, the CAAA will require major stationary sources to control the emissions of nitrogen oxides which also contribute to the formation of ozone air pollution.

Overall, there are indications the air quality has improved in our region attributable to previous control measures. In fact, in 1991, there were no violations of the ozone standard reported in the tri-county area. There are concerns that continued population growth bringing more automobiles to our highways, and utilizing more energy will result in air quality degradation. However, given the new requirements of the CAAA, there is confidence that the air quality will be maintained and attainment of the ozone standard will be achieved as required.

▼*Protecting Ozone in the Upper Atmosphere*

Another concern having global implications is the destruction of the earth's upper level protective ozone layer by chlorofluorocarbons, more commonly known as CFCs. These ozone destroying compounds are primarily used throughout the world as refrigerants for automobile, residential and commercial air conditioning (AC) units, as well as foaming agents. These compounds usually enter the atmosphere from leaking AC systems and from intentional venting during service and maintenance.

To address the problem nationally, the Clean Air Act Amendments (CAAA) of 1990 require that ozone depleting CFCs be phased out by the year 2000 and replaced with safe substitutes. Additionally, the Montreal Protocol, an international agreement designed to control the production and consumption of CFCs worldwide, was signed in 1987 by the USA, Canada, 24 major industrialized nations and the European Economic Community. The Protocol calls for a 50% reduction in use of CFCs by 1998.



Recent scientific data shows that the destruction rate of the ozone layer is even greater than previously thought. An "ozone hole" similar to the one discovered over the Antarctic region is expected to form over the populated regions of North America within the next decade. This alarming development has led President Bush to call for an acceleration in the CFC phase out to 1995 instead of the year 2000 as required by the CAAA. It has also been documented that CFCs have an atmospheric life of over 120 years. In other words, once they enter the upper atmosphere they do not break down easily; they repeatedly attack and destroy the protective ozone layer.

Experts have also concluded that the atmosphere's ability to defend itself against ozone depleting chemicals has been overestimated. The resulting increase in unfiltered UV radiation to the earth's surface could lead to adverse health effects including more skin cancers, cataracts, and even suppression of the human immune system. Negative environmental effects such as changes in weather patterns, and stress on marine and plant life from increased exposure to UV radiation are also very possible in the near future.

Locally, the PBCPHU will enforce a state law that prohibits the release or venting of CFCs during maintenance and service of automobile air conditioning systems. The law which became effective July 1991 also requires licensing of AC service shops, training of technicians and certification of CFC recovery and recycling equipment. Beginning in July 1992, similar requirements will also extend to cover stationary AC units, in both residential and commercial applications.

▼*Biohazardous Waste Incineration*

In June of 1991, the Palm Beach County Board of County Commissioners passed a resolution placing a one year moratorium on the construction of new biohazardous waste incineration facilities (BWIFs) in this county. In addition, a Biohazardous Waste Task Force was established to review current treatment and transportation techniques. Reasons for these actions included:

- Heightened public concern
- Heavy metal, acid gas, and dioxin air emissions from BWIFS
- Toxicity and health affects associated from exposure to these pollutants
- Concern over the mercury concentrations found in the Florida panther
- Toxicity of bottom and fly ash from BWIFs
- Potential health threats resulting from accidental spills of untreated biohazardous waste enroute to a BWIF
- Exposure of environmentally sensitive lands to these air pollutants
- Other equally effective available technologies that do not emit these air pollutants

It is the goal of the Task Force to adopt an ordinance that would provide further protection to the citizens of Palm Beach County from the dangers associated with transportation and treatment of biohazardous waste. To ensure representation of all concerned parties, members include the Palm Beach County Medical Society, the Palm Beach Veterinary Society, the Sierra Club, the Solid Waste Authority, the Palm Beach County Public Heath Unit, and four interested citizens. The Task Force has been instructed to complete this work by June 1, 1992.

The Air Pollution Control Section has acted, in part, as staff for the Task Force recommending various options and providing technical guidance. The air section prepared the initial draft of the proposed ordinance combining the interests and recommendations of the Task Force. The draft ordinance establishes air emission standards, air emissions compliance testing, and continuous emissions monitoring. Pollutants of concern included carbon monoxide, particulate matter, hydrochloric acid, cadmium, chromium, lead, mercury, and dioxins. In essence, the Task Force is proposing stricter pollutant standards than the current state or federal regulations.

ENVIRONMENTAL SCIENCE & ENGINEERING / AIR POLLUTION CONTROL

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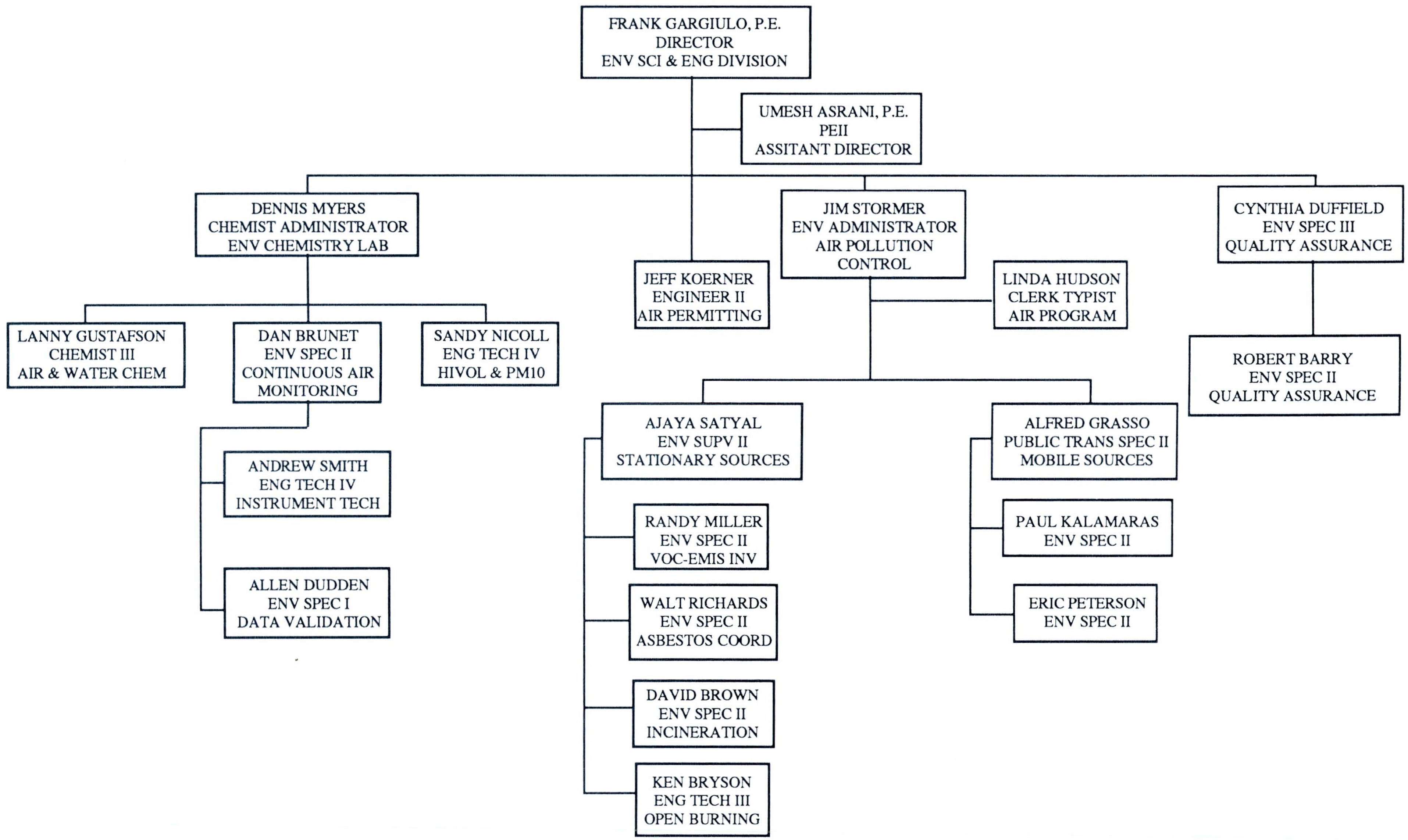

- FRANK GARGIULO, P.E.
DIRECTOR
ENV SCI & ENG DIVISION
  - UMESH ASRANI, P.E.
PEII
ASSITANT DIRECTOR
  - DENNIS MYERS
CHEMIST ADMINISTRATOR
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ENV SPEC II
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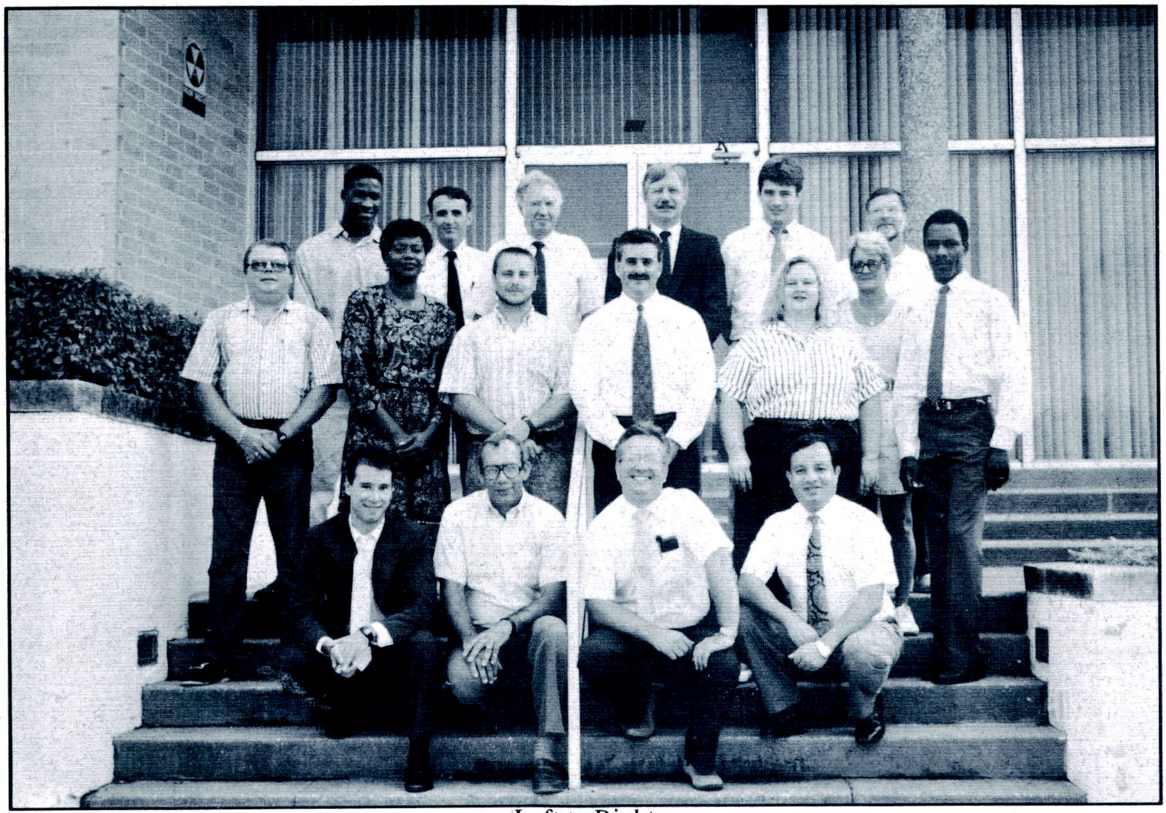
HRS / Palm Beach County Public Health Unit's Air Pollution Control Staff



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Second Row
Al Dudden, Linda Hudson, Jeff Koerner, Al Grasso, Cindy Duffield, Sandy Nicoll, Walt Richards
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